



LORD CHIEF JUSTICE
OF ENGLAND AND WALES

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LORD CHIEF JUSTICE OF ENGLAND AND WALES

EXPERT EVIDENCE

THE FUTURE OF FORENSIC SCIENCE IN CRIMINAL TRIALS

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THE 2014 CRIMINAL BAR ASSOCIATION KALISHER LECTURE

CHECK AGAINST DELIVERY

Introduction

1. With all of the problems and issues currently facing the criminal bar, some of you are no doubt wondering why I have decided to speak to you this evening about expert evidence and particularly forensic science. There are three reasons: first there is clearly the issue of social mobility and the profession; that is an acute issue and one which was central to the work of Michael Kalisher. The work of the Kalisher Trust has already done so much and the profession is now realistically facing up to the problems caused by the debts incurred by law students and the help that needs to go to those that choose a career in publicly funded work; radical solutions are needed, but it must be for the profession and the Inns first to formulate and publish their proposals. Second, the issue of remuneration for publicly funded work and the future of the independent bar in publicly funded work. This is also of fundamental importance, but it is not something I can say much new about at present. I have said as much as I can until there are more developments, particularly the report of Geoffrey Rivlin QC. Third, there is a risk for any profession that in focussing its attention primarily on issues that are central to its ability to function as a profession in fact open to all, however important, other longer term issues about which the profession ought to be concerned are overlooked.

2. Why is forensic science a relevant and topical subject for this evening's lecture? First, as a brief view of the past shows, we have always faced problems. Second, there are current problems. Third, we have had excellent proposals for reform from the Law Commission which have been largely implemented in a novel way. Fourth, embedding the reforms and addressing other problems is important for overall public confidence in criminal justice. It will show the public why justice matters at a time when there is a risk that justice will be overlooked as there are so many other calls on the public purse.

Why forensic science matters

3. Scientifically rigorous, but accessible forensic science matters to the criminal justice system as a whole, which is the “customer” for forensic evidence. It matters to you, the members of the criminal bar, who rely on expert evidence whether representing the defence or prosecution, to represent properly your client. It matters to the judiciary in ensuring fairness of proceedings, directing the jury, and upholding the rule of law. And it matters to society more generally, in ensuring that the innocent are not convicted of crimes they did not commit and that the perpetrators of serious crimes are brought to justice. Only three weeks ago, the Telegraph ran the dramatic headline, “Criminals could appeal after Home Office admits potentially misleading DNA evidence presented to juries”¹ in response to the publication by the Regulator of a consultation on draft guidance on the effects cognitive bias on forensic science examinations; dramatic at any rate until one notes the qualification of “could” - we will have to wait and see. I am slightly more than an interested bystander, having given the judgment in one of the appeals, so will comment no further.

Why it is relevant and topical for the Criminal Bar

4. The vast majority of serious cases, and a significant proportion of all Crown Court cases, now include presentation of one or more types of forensic evidence. I expect that it plays a part in most of the cases in which you are currently instructed. But in large part because of its prevalence, we cannot afford to be complacent about its role in court. Scientific developments, inconceivable 20, let alone 50 years ago, come with risks: the pace of change and complexity of techniques present challenges for

1. <http://www.telegraph.co.uk/news/uknews/crime/11117598/Criminals-could-appeal-after-Home-Office-admits-potentially-misleading-DNA-evidence-presented-to-juries.html>, 23 September 2014

all involved, not least those of us without scientific backgrounds. The court must be satisfied that there is sufficiently reliable scientific basis for the evidence to be admitted – how can it meet this challenge?

5. Perhaps the most obvious point for all of us here, is the risk of a miscarriage of justice if the forensic science is wrong, or the expert presents or interprets it incorrectly, or indeed if the expert is deliberately misleading.
6. But however eminent and reliable the expert, the presentation of forensic evidence is rarely black and white. With increasingly complex or novel science there comes the risk of testing the science, rather than the evidence, in front of the jury. This in turns risks undermining juries' and public confidence in forensic science, with highly undesirable consequences, resulting either in less use of forensic evidence, or less use of juries. So there is a challenge for all of us – advocates and judges – to manage the presentation and testing of forensic evidence in such a way as to avoid fatally undermining confidence.
7. Finally, and bringing us back, with a sense of inevitability, to money, it is relevant because we need to find the right balance between the use of increasingly complex scientific evidence on the one hand, and the increasingly gloomy financial picture for justice and in particular the criminal justice system on the other.

A little history

8. The use of forensics has a long history: fingerprints have been used as a form of identification since antiquity. The development of the science and use in the criminal justice system is somewhat more recent: fingerprints have been used in the courts since the late 19th century and the process of identifying fingerprints through 12 matching points was proposed early in the 20th century; toxicology was first used in a jury trial in 1836.
9. The area that most immediately comes to mind when thinking about forensic science is DNA. It is already nearly 30 years since DNA analysis conducted by Sir Alec Jeffreys was first used in a criminal case to demonstrate that the defendant was not guilty. It now plays a significant part in many criminal investigations and trials. That science has not stood still: DNA technology continues to evolve, as techniques are refined and methods identified to test ever tinier samples. Only this year, labs in

England and Wales have moved to a new standard of profiling methodology known as DNA-17, not the first to make this switch, but ahead of many other countries. It is a point to which I will return.

10. The increasing importance of forensic science to the detection and prosecution of crime was reflected with the creation of the Forensic Science Service as an executive body of Government in 1991, to provide forensic analysis and conduct research. Two decades later, of course, it was closed down. It is inappropriate for me to comment on that political decision, but the longer term consequences of that closure, and the shift to private sector provision, is a matter of real interest to all of us. Even though it is still too early to know with any certainty what impact this will have on the long term future of forensic science research in this country, there are consequences which need addressing now.
11. But before leaving history to one side, it is important to mention that there is nothing new in the debate as to how expert evidence should be given. In his monumental *History of the Criminal Law of England*, Sir James Fitzjames Stephen set out his view about expert evidence. At the time of writing in 1882 there was a debate across the whole of the judicial system as to whether it was better to have an expert witness called by the court or answerable to the court as an assessor or whether the court should continue to hear the evidence of experts whose evidence was tested by cross examination; the debate was particularly vigorous in relation to the trial of business case with such great judges as Jessel, Bramwell and Blackburn taking the view that in such cases involving technical evidence, assessors would assisting a judge would be far better than a jury.²
12. Sir James was firmly in favour of the provision and testing of evidence in criminal cases by cross examination. He pointed out, however, that an issue had arisen in relation to the way in which doctors gave evidence. Medical men, apparently, did not like cross examination. He had this advice³,

“There is one way in which medical men may altogether avoid the inconveniences of which they complain, and that is by knowing their business and giving their testimony with absolute candour and frankness. There have been, no doubt, and there still occasionally are, scenes between medical witnesses and the counsel who cross examine them which are not creditable, but the reason

² Third Report of the Judicature Commissioners, 1873

³ Vol I, page 576

is that medical witnesses in such cases are not really witnesses but counsel in disguise, who have come to support the side by which they are called If medical men lay down for themselves a positive rule that they would not give evidence unless before doing so they met in consultation the medical men to be called on the other side and exchanged their views fully so that the medical witnesses on the one side might know what was to be said by the medical witnesses on the other they would still be able to give a full and impartial account of the case which would not provoke cross examination ... If they steadily refused to act as counsel and insist on knowing what is to be said on both sides before they testify, they may not fear cross examination.”

The Law Commission Proposals

13. In response to a recommendation from the previous Parliament⁴ and concern arising from cases in the early 2000s in relation to expert evidence, the Law Commission produced in March 2011 an excellent report on expert evidence in criminal proceedings, following its 2009 consultation.
14. One of the principal concerns of the Law Commission was that expert evidence was being admitted too readily, with too little scrutiny, and recommended the introduction of: a statutory admissibility or reliability test – a proposal which the senior judiciary supported; a list of factors to assist judges in applying the test; and the codification of existing law. Apart from providing a much surer basis for the admissibility of expert evidence, a further objective of these proposals was to avoid the risk of the jury being confused and distracted by complex and conflicting expert accounts.
15. The Government response in November 2013 rejected the recommendations for primary legislation. However, the Rule Committee has adopted as many of its recommendations as it could adopt through Rules; these have been accompanied by the Practice Directions⁵. Thus although the common law remains the source of the criteria by reference to which the court must assess the admissibility, the Rules simply list those matters which must be covered in the experts' report so that the court can conduct such an assessment. The Practice Directions list the factors the court may take into account in determining the reliability of expert opinion.

⁴ House of Commons Science and Technology Committee, *Forensic Science on trial*, March 2005

⁵ Crim PD 33A.5

16. Furthermore, the Rules encourage discussion between the parties in advance of trial, where more than one party wishes to introduce expert evidence, and enable the court to direct that the experts meet, and if possible produce a report setting out the areas where they agree and disagree. In this way, the issues to be put to the jury may be narrowed to those where there is disagreement.
17. This is plainly a novel way of implementing an excellent Report. With the changes in the common law that paralleled the Report, the Rules and the Practice Direction together with the work under taken by the Advocacy Training Council, the Report has been nearly implemented.
18. However, even though the law and practice have been greatly improved, there are further measures we must take in respect of expert evidence relating to forensic science. I propose to examine what is needed under three headings - getting the science right; getting the right expert; and the use and understanding of forensic science in order to ensure a fair trial.

Getting the science right

19. For a long time the courts of England and Wales did not insist on a proper assessment by the judge of the reliability of the underlying science. However, as I have briefly mentioned and in line with the views of the Law Commission that evidence only be admitted if reliable, a series of cases largely arising out of the use of Low Template DNA has established the requirement that the court can only admit expert evidence if it is reliable. The Practice Directions have not only given guidance to judges in this task, but made clear that nothing precludes a court from having regard to the factors set out by the Law Commission⁶.
20. Even though therefore the Law Commission's proposals have in effect been largely implemented in this novel way, other steps must now be taken in assuring the reliability of a development or application of science or an entire science before its use is proposed in court.
21. In my view it is essential that this is done because, as forensic evidence has become commonplace, even expected, in criminal trials, the public's faith in forensic science

⁶ Crim PD 33A.4

has become an important part of the reality of the way in which our system works. This has been attributed by some to the “CSI Effect”: a diet of TV crime dramas depicting glamorous forensic analysts solving crimes through the forensic evidence alone, through ever more complicated techniques.

22. I would hesitate to be too quick to assume that the general public's faith in forensic evidence differs greatly to that of the legal profession. Many lawyers and judges generally believe that forensic evidence is based on sound science. But is this confidence misplaced? Can its reliability be assured by the test of admissibility?

Scientific rigour

23. You will know that many of those who have advocated the introduction of a reliability test have pointed to the decisions of the US Supreme Court in *Daubert v Merrell Dow Pharmaceuticals*⁷ and other decisions⁸. It is therefore important to note that in its excellent and thought-provoking 2009 report to Congress, the US National Academy of Sciences (NAS) warned that:

“with the exception of DNA analysis, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.”⁹

24. NAS was critical of common methods of fingerprint and hair analysis, and observed that ballistics and handwriting analysis are based on tenuous and largely untested science. I will turn to steps that are being considered in our jurisdictions to address these issues, but it is first important to note that not all branches of forensic science are equal, in terms of scientific rigour. For a scientist, analytically based disciplines are generally more rigorous than those based on expert interpretation. And the disciplines can be ranked even within those categories: for example within the expert interpretation category, there is more research in relation to fingerprint analysis compared to bite marks: the NAS was particularly sceptical of the scientific basis of bite mark evidence.

25. In the jurisdictions within these Isles, we have been fortunate to have the engagement of scientists under the auspices of the Royal Society in addition to the

⁷ 509 US 579 (1993); see *Reed* [2009] EWCA Crim 2698 at 111 and *Broughton* [2010] EWCA Crim 549 at 32

⁸ *General Electric v Joiner* 522 US 136 (1997); *Kunbo Tyre v Carmichael* 526 US 137 (1999)

⁹ NAS report, page 7

engagement of the Royal Statistical Society. In line with the NAS findings, they reminded me that although the Court of Appeal has recently considered several cases on grounds linked to the DNA evidence, so it is the area of forensic science at the forefront of my mind and that of many of my colleagues, this is one of the most robust areas of forensic science. With the invaluable help of the Royal Society, scientists interested in forensic science are keen to strengthen the scientific rigour of many areas of forensic science. Areas that are that may receive the first attention of this more rigorous scientific approach are: blood pattern analysis, forensic entomology and footwear prints.

26. In a significant number of cases, in particular the most serious cases, the credibility of the criminal justice system depends on the quality of the science underpinning the forensic evidence, in order to preserve confidence in the experts and the evidence they present. I do not think it inappropriate or controversial for me, or indeed members of the criminal Bar, to agree with the scientific community that more research is needed, in particular in relation to those disciplines where there is very little peer reviewed, published evidence – and it is self-evident that research requires money. The need for research is a constant: it will never be finished.
27. For the purposes of use in the criminal courts, research needs validation, to provide data to support the interpretation of forensic science, and to make it comprehensible to the court. Of course, this data does not in itself provide all of the answers – I know this all too well from the cases I have dealt with in the Court of Appeal – but it is an essential part of the process. The debate about the adequacies or otherwise of research funding are better left to the experts – and debate it they certainly do, prompting headlines such as that in the Times 18 months ago - “Britain goes from 'pole position to banana republic' in DNA profiling.”¹⁰

The effect of the new market based provision

28. Some witnesses to the Science and Technology Committee's inquiry last year, including Professor Sue Black, questioned whether the system is now too driven by cost considerations; that is primarily a political issue, but one issue which is of great concern is the putting of all information that forensic science providers obtain into

¹⁰ The Times, 25 April 2013, as cited in the Science and Technology Committee, Second Report of session 2013-14, *Forensic Science*, para 76.

the public domain. In many areas of technology and science, the safeguarding of the confidentiality of scientific and technological work is an inherent part of a market; however such confidentiality has a very limited place in forensic science when used in court. Where a development in forensic science is used in court, information that goes to the reliability of the technical or scientific method used must be put into the public domain and made available to all. That is because in relation to the use of such science in criminal justice, commercial considerations of a kind which might ordinarily be applicable must take second place to the provision of all material which is relevant to establishing innocence or proving guilt.

29. In *R v T¹¹*, the defendant was convicted at trial on the basis of DNA and footwear print evidence; in relation to the latter, the issue that has caused the greatest interest amongst forensic scientists was the court's view on the use of the Bayesian theorem – a subject which I will not enter into this evening. However, what in the context of this lecture are two related problems: the robustness of the underlying technology and the size of the database, were also key issues at the trial. At that time the FSS had by far the largest data set available¹², but what would be the position today without the pooling by the commercial providers of their databases?

Regulation

30. Alongside the need for research is the need for regulation. The role of the Forensic Science Regulator is to ensure that the provision of forensic science across the Criminal Justice System is “subject to an appropriate regime of scientific standards”.¹³ At its most basic level, it should ensure minimum quality and security standards for the accreditation of forensic laboratories. I know there are differing views on the question of statutory powers for the regulator, but I take the view that such powers are now necessary, to ensure and if necessary enforce compliance with quality standards.
31. Any breach of the Code will be taken very seriously. Obviously it may impact on the reliability of the evidence (and hence its admissibility) or the integrity of the expert witness. In addition, the Court has power under s.78 of PACE to exclude

¹¹ [2013] 1 Cr App R 9

¹² See paragraphs 83-87

¹³ Forensic Science Regulator: What we do, Gov.uk

prosecution evidence if the breach has an adverse impact on the fairness of the proceedings.

32. Funding, regulation and governance are not only matters of concern in England and Wales, they are also international concerns, picked up in the NAS report in 2009, which summarised the consistent message that it heard as follows:

“the forensic science system, encompassing both research and practice, has serious problems that can only be addressed by a national commitment to overhaul the current structure that supports the forensic science community [..]. This can only be done with effective leadership at the highest levels [...], pursuant to national standards, and with a significant infusion of federal funds”¹⁴.

33. The report went on to recommend the creation of a National Institute of Forensic Science in the US. Closer to home, the House of Commons Science and Technology Committee concluded last year,

“There are risks to the justice system’s ability to convict criminals and meet the needs of victims unless there is a proper strategy for forensic science following the closure of the FSS.”¹⁵

34. All of this would matter less if we were dealing with something static, so that once a particular discipline were underpinned by robust, peer reviewed science it remained a reliable form of evidence; but the constantly evolving and improving techniques and technologies, combined with the open market, require us all to remain vigilant to the unintended consequences of what on the face of it appear to be beneficial developments.

35. It is already clear that the open market system has interesting implications in the field of DNA. The combination in England and Wales of the open market and allowing multiple providers to use multiple testing technologies is unique within the United Kingdom, although not entirely dissimilar to the market in the US. As I have already mentioned, we have recently moved to a new 16-loci system for profiling DNA, known as DNA-17. This in itself is not necessarily groundbreaking: we have coped with changes in methodology in the past, with the move from SGM (second generation multiplex) to SGM+ in 1999, and the introduction of low template DNA analysis, albeit with tests in the courts. However, the regulator allows providers to

14 NAS report, preface, p xx

15 Science and Technology Committee, Second Report of session 2013-14, *Forensic Science*, para

use a range of different testing methodologies, which may, under certain circumstances, produce very slightly different results.

36. The fact that I am able to mention this is an example of the much closer links between the scientific community and the operation of the criminal justice system than was evidence when the new technology of Law Template DNA was introduced. Although the consequences of the development of DNA-17 have yet to be tested in the courts, it is something of which the judiciary were made aware before its introduction and which we will need to watch carefully.
37. Although those that practice in criminal justice and the judges will have to observe these developments with care, ultimately it must be for the scientific professions to ensure the quality and integrity of all disciplines of forensic science. I therefore welcome the steps being taken by the scientific community to put in place a much more rigorous approach along the lines recommended by NAS in the USA.

Getting the right experts

38. At the next stage of the process, it is very much a shared interest for both the scientific and legal professions to ensure that those who provide expert evidence to the courts have quality and integrity. To refer to the NAS report once again, it posited that the adversarial process is not best suited to the task of finding “scientific truth”: judges and lawyers, broadly speaking, lack scientific expertise so have to rely on experts.¹⁶ For all branches of the legal profession, it is important that those experts upon whom we rely in court meet the highest standards of their own profession. I am firmly of the view that the approach of Sir James Fitzjames Stephen remains as valid today as it was at the end of the nineteenth century: we should continue to rely on experts whose evidence is tested by cross examination, not on assessors.

Accreditation

39. From 1999 to 2009, the Council for Registration of Forensic Practitioners was intended to fulfil this function, providing the court with a single point of reference for the competence of forensic experts. The system had failings, however, including

¹⁶ NAS report, page 12

its voluntary registration system and the exclusion of those accredited through other channels. Since the closure of the Council, the Forensic Science Society has looked to fill part of the gap: it has acquired Royal Charter status and is introducing a system of accreditation to set uniform standards for members acquiring chartered status.

40. Whatever course witness accreditation might take, a court is dependent on the integrity of expert witnesses. If there is any lack of integrity courts must take whatever stringent steps are open to them.

Use and understanding of forensic evidence in order to ensure a fair trial and preserve the trial process

41. Even if we have absolute confidence in the reliability of the science and the expertise and integrity of the expert witness, we have to ensure that we continue to be able to use juries for trials where forensic evidence, even of a complex kind, plays a central role in the trial.
42. Juries cannot and should not be expected to understand and interpret complex scientific concepts. This should, I hope, be a matter of common sense, but it is also important in order to avoid unnecessary use of limited court resources, and in order to avoid juries reaching perverse decisions which might contribute to a loss of confidence not only in specific scientific areas, but more fundamentally in the system of trial by jury.
43. Of course, this is not to say that opposing, scientifically based views should not be tested before the jury - on the contrary, they must be; rather that this should be restricted to only those circumstances where it is genuinely an issue, and efforts made to minimise the number of contentious scientific questions in relation to which a jury is asked to decide. I do not regard this as a controversial, because it is very rare to have a case where a large part of the complex technical or scientific evidence is not common ground.
44. In order to assist this task, I would like to go much further than leaving it to the experts in individual cases. I have had discussions over the years with the former Regulator, and others, about the feasibility of producing standardised documents

relating to the most popular areas of forensic science, which would presenting the basic science in an accessible, plain English format. This is what is done to great effect in the Patent Court and suitably adapted would make a great deal of difference. These “primers” would be restricted to the areas on which there is consensus amongst the scientific community and would, in my view, assist juries in understanding the concepts underpinning the issues in their case. There is of course a risk of oversimplifying scientific evidence, and that is not the intention: it is simply intended to assist juries with the basics, so that they can focus on the evidence in front of them. There would also be a challenge in keeping them updated, given the developments in science. However, it is something I hope to be able to pursue over the coming year.

45. I should add that I think such guidance would be as useful for judges and others involved in the system as for jurors. Most of us are not scientists, and although many at the Bar and on the bench develop specialisms in particular fields over the years, I can still see value in this sort of resource.
46. This links neatly to the work being undertaken by the Advocacy Training Council to support advocates in making an informed assessment as to the reliability of experts, which responds in part to the Law Commission’s proposals for the considerations that should be taken into account when assessing the reliability of expert opinion evidence. The ATC is developing a best practice toolkit, drawing on the factors set out in the Law Commission’s draft Bill. It also hopes to run training days for advocates and to produce a short pamphlet on “good use of statistics in court” in conjunction with the Royal Statistical Society, to assist advocates across all jurisdictions, not only the criminal courts.
47. As was noted recently in *H v R*¹⁷, the combination of the changes to the Rules and Practice Directions and the implementation of the Advocacy Training Council’s work could – indeed in the words of the judgment must – result in the adoption of a new and more rigorous approach on the part of advocates and the courts to the handling of expert evidence.

Conclusion

¹⁷ [2014] EWCA Crim 1555

48. Of course, I hope it goes without saying that expert evidence is generally only part of the evidence and juries must reach their verdict on the whole of their evidence. But scientific advances have transformed the way that crime, in particular serious crime, is investigated and prosecuted. The criminal justice system and the people within it, professionals and jurors alike, face a constant challenge to keep up with developments, and to understand the relevance and value of the evidence in front of them.

49. Matters that were once seen as incontrovertible scientific facts can be proved otherwise and there is always a risk that convictions prove unsafe in light of subsequent scientific developments. Financial constraints affect every part of the system, and everyone working within it, as you know better than most. But through a combination of improving the quality of the scientific underpinning of forensics; the quality, probity and focus of experts, and the manner in which expert evidence is presented to and tested by the courts, we can work with these challenges, and ensure proper safeguards for defendants while avoiding the risk of juries and the wider public losing faith in the value of forensic science to the courts.